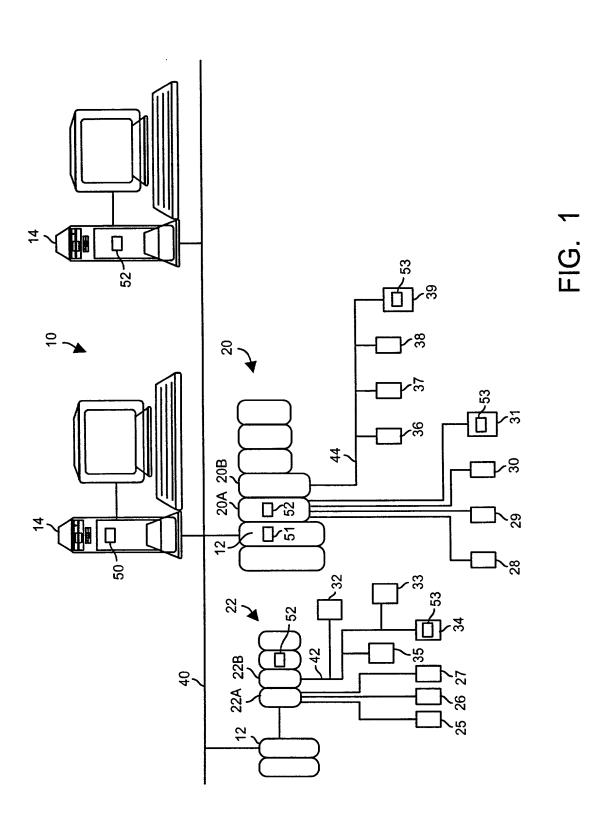
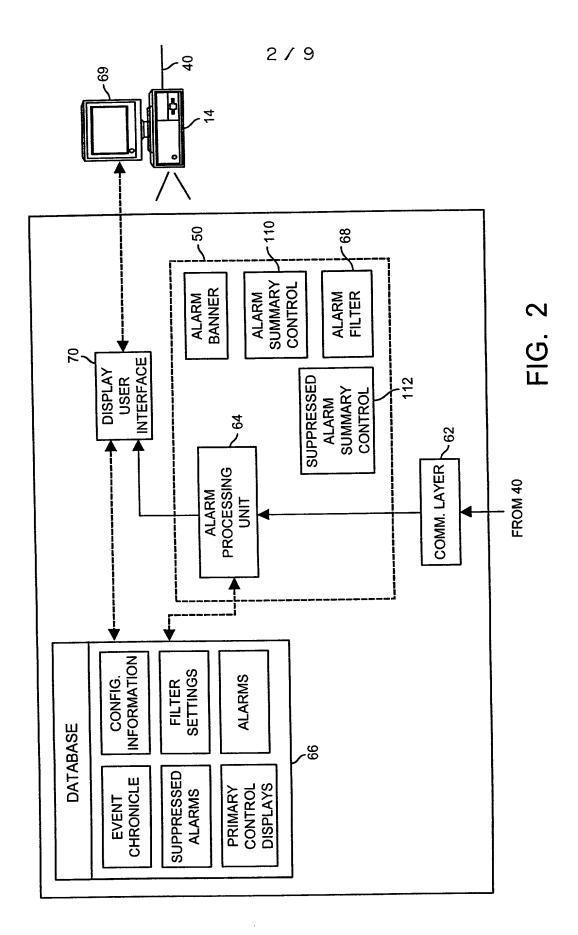
06005/37172 Enhanced Device Alarms in a Process Control System Robert B. Havekost (fig. 1)

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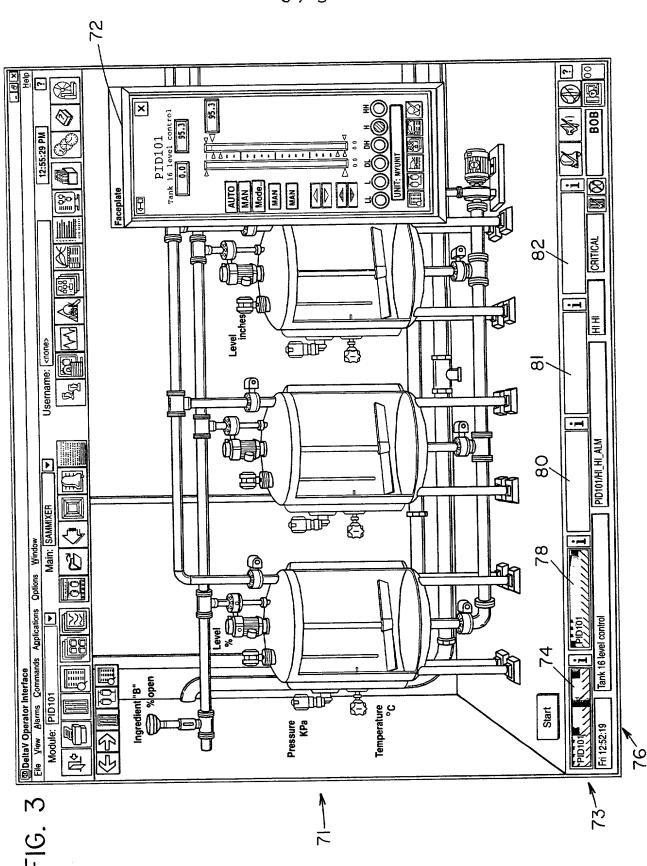


Enhanced Device Alarms in a Process Control System

Robert B. Havekost (fig. 3) Inventor:

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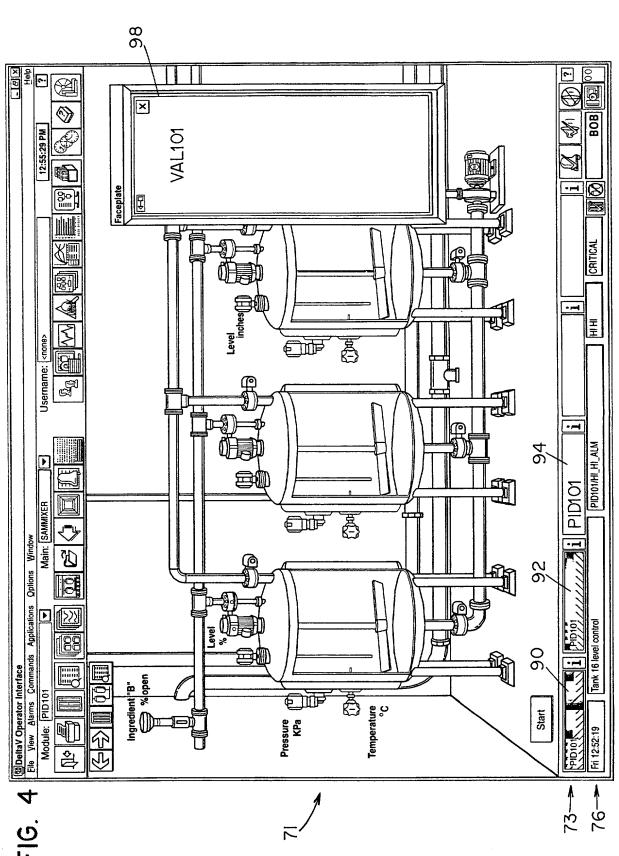


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High Alarm Value 1027 Limit 1000 WARNING

Alarm Parameter Module Description Alarm Word Alarm Message

Mon 15:10:04 REACTOR1 FIC-101/HI\_ALM Reactor 1 jacket heat flow HIGH

Unit

Time

Mon 15:10:04; Reactor I jacket heat flow

Priority

WARNING

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İ	CRITICAL	Priority CRITICAL		1	RITICAL	Priority	CRITICAL
	FV-101/FAILED_ALM FAILED CRITICAL	Time Unit Alarm Parameter Module Description Alarm Word Alarm Message Mon 15:10:04 REACTOR1 FV-101/FAILED_ALM Reactor 1 inlet valve FAILED 1/P Feedback limit: 103.47	FIG. 6		CTLRI/CARD04 FAIL FAILED CRITICAL	Module Description Alarm Word Alarm Message	CTLRI/CARD04_FAIL Room 4, cab 3, pos 2 FAILED Channel 7 failed
FIC-101	ctor I inlet valve	Alarm Parameter R1 FV-101/FAILED_A		FIC-101	m 4, cab 3, pos 2	Alarm Parameter	CTLR1/CARD04_F/
FV-101 i	Mon 15:10:04   Reactor I inlet valve	Time Unit Mon 15:10:04 REACTO		CTLR1 i	Mon 15:10:04   Room 4, cab 3, pos 2	Time Unit	Mon 15:10:04

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Inventor:

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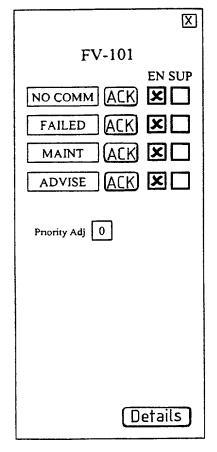


FIG. 8

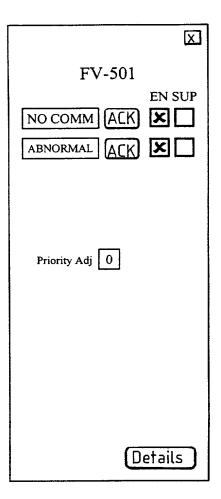


FIG. 9

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	X
CTLR1	
CTLR_FAIL	
CARD11_COMM	
CARD27_FAIL	
CARD02_COMM	
(ACK All	
Disable Alarms	
Priority Adjust 0	
Summa	гу

FIG. 10

Show Alarms Alarm types:	Enable	X	
Process	×	4 All alarms	
Hardware	×	8 Warning	
Device		No alarms	

FIG. II

		8 / 9			4
	α		FIG. 13		F16. 14
	FIG. 12	<del></del>	<b>+</b>	Priority WARNING CRITICAL WARNING WARNING WARNING WARNING	ADVISORY  ADVISORY
A LING CAL LING CAL LING LING CORY CORY	\$ORY ◆	_	ADVISORY  ADVISORY	imit = 1000 t 103.7 tt = 78 imit = 1000 imit = 1000 imit = 1000	t = 78 60 minutes
1000 WARNING 7 WARNING 7 CRITICAL 1000 WARNING	ninutes ADVISORY    Message	Value = 1011.4 Limit = 1000  Value=30114 Limit 103.7  Value=30114 Limit = 1000  Travel limit 35001  Value = 1011.4 Limit = 1000  Value = 1011.4 Limit = 1000  Value = 1011.4 Limit = 1000	Value = 81.4 Limit = 78 Low variation for 60 minutes	Message Value = 1011.4 Limit = 1000 I/P Feedback limit 103.7 Value = 81.4 Limit = 78 Value = 1011.4 Limit = 1000 Travel limit 35001 Value = 1011.4 Limit = 1000 Value = 1011.4 Limit = 1000 Value = 1011.4 Limit = 1000	Value = 81.4 Limit = 78  Low variation for 60 minutes
Message Value = 1011.4 Limit = 1000 I/P Feedback limit 103.7 Value = 81.4 Limit = 78 Value = 1011.4 Limit = 1000 Travel limit 35001 Value = 1011.4 Limit = 1000 Value = 1011.4 Limit = 1000 Value = 81.4 Limit = 78 Value = 81.4 Limit = 78	Low variation for 60 minutes Alarm Messal	Value = 1011.4 Limit = 1  Value=101.4 Limit = 103.7  Value=1011.4 Limit = 1  Travel limit 35001  Value = 1011.4 Limit = 1  Value = 1011.4 Limit = 1	1	Alarm   Alarm   HI	SE
	1 1 1 1	_ +	HIHI	Description Tank 5 outlet flow control Reactor 1 jacket flow sensor Reactor 3 Level control Tank 5 outlet flow control Reactor 2 jacket flow sensor Tank 5 outlet flow control Tank 5 outlet flow control Reactor 1 Level control	el control Ilow sensor
ntrol HI rsensor FAILED rol HIHI ntrol HI risensor MAINT ntrol HI ntrol HI ricol HI rol HI rol HI rol HIHI	sensor ADVISE	Tank 5 outlet flow control Reactor 1 jacket flow sensor Reactor 2 jacket flow sensor Tank 5 outlet flow control Tank 5 outlet flow control Tank 5 outlet flow control Reactor 1 Level control	Reactor 2 Level control Tank 5 outlet flow sensor	Description Tank 5 outlet flow control Reactor 1 jacket flow sen Reactor 3 Level control Tank 5 outlet flow control Reactor 2 jacket flow sen Tank 5 outlet flow control Tank 5 outlet flow control Reactor 1 Level control	Reactor 2 Level control  Tank 5 outlet flow sensor
Description Tank 5 outlet flow control Reactor 1 jacket flow sensor Reactor 3 Level control Tank 5 outlet flow control Reactor 2 jacket flow sensor Tank 5 outlet flow control Reactor 1 Level control Reactor 1 Level control Reactor 2 Level control	outlet flow s	- 5 -	≥ 8	LEM ALM	≥
_ > _	ALM ort: Ba	FIC-501/HI_ALM FV-101/FAILED_ALM LIC-301/HI_HIZAEM. FIC-501/HI_ALM FV-102/MAINT_ALM FIC-501/HI_ALM FIC-501/HI_ALM FIC-501/HI_ALM	LIC-102/HI_HI_ALM FV-502/ADVISE_AL 1 / 2 Sort:		
Alam Parameter FIG-501/HI_ALM FV-101/FAILED_ALM LIG-301/HI_HI_ALM FIG-501/HI_ALM FV-102/MAINT_ALM FIG-501/HI_ALM FIG-501/HI_ALM FIG-501/HI_ALM LIG-101/HI_HI_ALM LIG-102/HI_HI_ALM	FV-502/ADVISE			Occurred Unit Wed 12:46:30 Wed 11:48:54 REACTOR1 Wed 10:51:18 REACTOR3 Wed 09:53:42 Wed 08:56:06 REACTOR2 Wed 07:58:30 Wed 07:00:54 Wed 07:03:18 RFACTOR1	Wed 04:08:06
_	vice:	Jana jana jana jana jana jana jana jana	Wed 05:05:42 REACTOR2 Wed 04:08:06 Ss: 1 / 34 Device:	Occurred Wed 12:46:30 Wed 11:48:54 Wed 10:51:18 Wed 09:53:42 Wed 07:58:30 Wed 07:00:54	Wed 05:05:42 Wed 04:08:06
Occurred         Unit           Wed 12:46:30         Wed 11:48:54           Wed 11:48:54         REACTOR1           Wed 10:51:18         REACTOR3           Wed 09:53:42         Wed 08:56:06           Wed 07:58:30         Wed 07:58:30           Wed 07:00:54         Wed 06:03:18           Wed 06:03:42         REACTOR1	Wed 04:08:06  SS: 1 / 34 De	Wed 12:46:30  Wed 11:48:54  Wed 09:53:42  Wed 07:58:30  Wed 07:00:54  Wed 06:03:18	✓ Wed 05:05:42 ✓ Wed 04:08:06 ← Process: 1 / 34		> > 1
	✓ We				

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Desc2	High Alarm Value 1027 Limit 1000		High Alarm Value 1014 Limit 1000		High Alarm Value 998 Limit 1000	Desc2	imited: 103.47		imited: 103.47		
	High Alarm Va		High Alarm Val		High Alarm Val		I/P Feedback limited: 103.47		I/P Feedback limited: 103.47		1.00 T 1. 1. 1. 00 0
Desci	HIGH		HIGH		HIGH	Desci	FAILED		FAILED		į
Level	11-WARNING	:	11-WARNING		11-WARNING	Level	15-CRITICAL		15-CRITICAL		10000000
State	ACT/UNACK		ACT/ACK		INACT/ACK	State	ACT/UNACK		ACT/ACK		2011
Parameter	HI_ALM		HI_ALM		HI_ALM	Parameter	FAILED_ALM		FAILED_ALM		711
Module	REACTOR1/FIC-101		REACTORI/FIC-101		REACTOR1/FIC-101	Module	REACTOR1/FV-101		REACTORI/FV-101		
Node	CTLRI		CTLRI	i	CTLRI	Node	CTLR		CTIR		- 
Area	AREA_A		AREA_A		AREA_A	Area	AREA_A		AREA_A		* V 20 V
Category	PROCESS		PROCESS		PROCESS	Category	DEVICE ,		DEVICE /		901/100
Event Type	ALARM		ALARM		ALARM		ALARM		ALARM 1		718717
Date/Time	ххххх		хххххх	••	XXXXX	Date/Time Event Type	XXXXX	••	яхххх	••	-